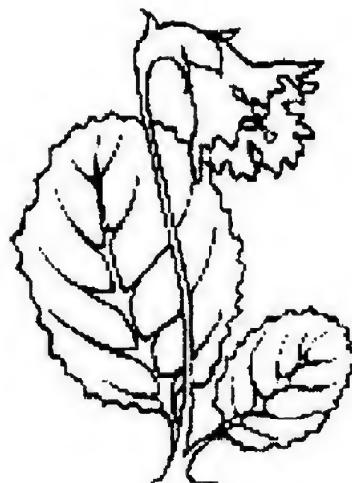


SHORTIA

NEWSLETTER OF THE

WESTERN CAROLINA BOTANICAL CLUB

Spring 2018



Shortia galacifolia

Oconee Bells

ATTENTION: FINAL NOTICE

The Annual dues of \$15 for 2018 were payable to January 1st. For those of you who have not yet paid, please write a check to WCBC and immediately mail it to Alan Graham. If you can't remember if you have paid, you can check with Alan at 828-884-3947 or

adgraham@comporium.net.

Checks can be mailed to

**Alan Graham
42 Autumn Glen Court
Brevard, NC
28712**

If you do not want to be in the Botanical Club anymore, please call or email Alan and tell him.

President	Susan Sunflower	Secretary	Mary Standaert
Vice-President	Gayle Mercurio	Treasurer	Alan Graham
Members at Large	Joe Standaert and John Harrison		

MEMBER NEWS

Field Trip Cancellations: Occasionally, field trips must be cancelled or changed either for weather conditions or other reasons such as road closings. Such changes are sent out by email to all members by 7 AM the day of the field trip. If you do not have email access, please call the leader, co-leader, or recorder (whose phone numbers are listed on the schedule) to be sure that the walk is going to go as planned. Indoor programs are cancelled when Henderson County Schools are closed (see <http://www.hendersoncountypublicschoolsnc.org>) but NOT necessarily cancelled because of delayed opening.



President's Message

by Susan Sunflower

Trees after hurricanes ...

Dagny Johnson Botanical State Park, on Key Largo FL, in November-December, was my first post-hurricane forest. It took a week or more to 'see' the trees, not just the forest. Here's some of what I saw:

Many tree species along the park roads had lost their tops, the trunk and sometimes a few bare branches remained. It seemed the roads acted as wind tunnels through the forest. In the inner forest, occasional trees were toppled, but most remained upright and branched, losing mostly leaves and smaller branches that stuck up above the dense stand of close growing trees.

Willow bustic or white bully, *Sideroxylon salicifolium*, grows up straight and tall, branching at the top. It has fairly dense wood and a rigid trunk. In open areas along the road, those branches dropped in the hurricane winds. Most had just some trunk left, a snag, but no branches nor leaf buds, the day after the storm. What's a tree to do?

Willows, poplars, oaks, and others use epicormic buds, dormant under the bark, suppressed during normal tree growth as they grew and branched into canopy. When that canopy was gone, after Hurricane Irma, just snags and lower trunks were still standing, so those epicormic buds got to work. By 1 November, there were fluffy, leafy green coats up the trunks and out any remaining limbs. By late December, the leaf and twig top was reaching out on some trees, beginning to look like a miniature canopy. Soon, a center meristem or main shoot will push up above the others, allowing the tree to grow upwards again. By the end of December, lower leaf clusters were thinning out, no longer needed for photosynthesis to get that tree growing. Those fluffy green coats were adorable, said our visitors.



I'm checking out the next burned hardwood forest I see—bet those leaf and branch losses trigger the same mechanism.



The gumbo limbo, *Bursera simaruba*, has another technique, the use of its photosynthesizing green under-bark. Gumbo limbos have red, paper tissue-thin bark that waves in the wind and glistens when the sun shines through. The tree limbs are flexible and wind tolerant; those at the gate of Dagny Johnson kept their canopy bud tips. Thus, the day after Irma, with no leaves to interfere with sunlight on the bark, photosynthesis began, and this was the first tree species to re-leaf in the Florida Keys. Other gumbo limbos, several hundred feet down the walk, did lose their canopy limbs. They simply dropped all fluffy red bark facing the sun, exposing more green under-bark, and began sending leaf and twig clusters out at the crooked tree top. One visitor at Dagny Johnson said "Striped maples do that where I live in upstate NY!" So I'll be looking

for striped maples on our walks. And I can hardly wait to hear what Alan has to say about all this!



Ethnobotany of the Cherokee

by Susan Goldsworthy

In this issue of *Shortia* I continue my series on the ethnobotany of the Cherokee people, examining their relationship with seven sacred plants. Below we explore the fifth of these plants, the Tuliptree.



Tuliptree (*Liriodendron tulipifera* L.)

Cherokee Name: tsi yu

Description: The fifth sacred plant of the Cherokee is our native Tuliptree (*Liriodendron tulipifera*) also known as Tulip Poplar, Tulip Magnolia, Canoe Wood, Yellow Poplar, White Poplar, Whitewood, Saddle-leaf Tree, and Fiddle-tree. A member of the family Magnoliaceae, it is a tall, deciduous tree with a long, straight, limb-free bole and a pyramidal crown that becomes oval-shaped with maturity; typically grows 6–9 feet in diameter and 60–90 feet high, but is known to reach 150 feet with a 30 foot diameter; bark is light, gray-green, and smooth when young, developing ridges, white-colored furrows, and diamond-shaped patterns with maturity; red-brown twigs often appear shiny or waxy and have a sweet, spicy odor when broken; buds are elongate and valvate, said to resemble a duck's bill; bright green, deciduous leaves are 4–8 inches long, alternate, simple, palmately-veined, smooth-margined, four-lobed with a broad, truncate apex, borne on petioles 2–4 inches long; flowers are showy, goblet-shaped, scentless 2 inches long, with yellow-green, fleshy petals, bright orange corollas and numerous stamens, appearing high in the tree during late spring to early summer, said to resemble tulip (*Tulipa*) flowers; fruit is an oblong, whorled aggregate of 2 inch-long samaras, maturing in August through October with the dried fruit often persisting to the following spring.

Related Species and Varieties: Historically botanists have noted two possible varieties of *Liriodendron tulipifera* based on the color of their heartwood—yellow and white.

In the 1780's both Marshall and Michaux described two different trees, one with yellow heartwood growing along streams and in damp locations and another one with white heartwood found in hilly woods and dry areas. The trees with yellow heartwood are easy to split and their timber lasts a long time, while timber from the white heartwood is difficult to split and decays within a year or two. Contemporary botanists

acknowledge two distinct colors of sapwood but deny separate varieties or forms, suggesting the difference in color may be due to the location where they grow.

Distribution and Adaptation: One of the tallest native trees in eastern North America, the Tuliptree is found from southern Ontario and Illinois, east to Massachusetts and Rhode Island, and south to central Florida and Louisiana. It prefers deep, well-drained, loamy soils and tolerates a wide range of pH. Known as a good pioneer species, it often dominates new and recently opened forests. This is due in part to prolific and persistent seeds that can remain viable up to 7 years as well as not being a favorite of deer and other browsers because of its strong aromatic odor.

Name Origin: The name *Liriodendron tulipifera* was given by Linnaeus in 1754, describing this species as “the lily tree that produces tulips.” The word liriodendron is from the Greek words “lirio” meaning tulip and “dendron” meaning tree. “Tulipifera” is from the Latin words “tulipa” meaning tulip and “fera” meaning to bear. The common names containing the word “poplar” may have been chosen because, like the many poplar (*Populus*) species, this tree’s long petioles cause the leaves to twist and quiver with the slightest wind.

Cherokee Legends: The Tuliptree plays a role in many Cherokee legends, including how trees became evergreen or deciduous. The story begins with the Great Spirit telling all the plants and animals to stay awake for seven nights. Only a few animals were able to do this, including the owl and the panther, and as a reward they were given the power to see and hunt at night. And only a few trees succeeded as well, including the pine, cedar, spruce, and laurel, and they were granted leaves that stay green throughout the year. All others, including the Tuliptree, were punished for not enduring and now must shed their leaves every winter.

One legend says that the Storm Spirits who live in the sky and command lightning and thunder would never strike a Tuliptree, and thus the Cherokee would often seek shelter under these trees during a storm.

Another legend says that good “fire-making” trees, like the Tuliptree, had swallowed fire long ago and that man could coax the fire back out of the wood if he knew the proper technique.

The Cherokee believed it was as important to treat dreams of a snakebite as it was to treat a physical bite. Their remedy for these dreams was to remove the inner bark of the Tuliptree and chew it. The bark was always removed from the east side of the tree because they believed this side received the most medicinal potency from the morning sun.

Cherokee Ethnobotany: The Cherokee people have many and diverse uses for the Tuliptree in their culture:

Boats: Perhaps the most important use of the Tuliptree was the crafting of dugout canoes, thus one of the common names, Canoe Wood. The tree is ideal for this as it grows very straight and tall without lower branches and does not easily split apart. The wood, however, is not especially rot-resistant, and each canoe only lasted about two seasons. Because the Cherokee in our region did not originally have metal tools, the Tuliptree trunk was strategically burned and then scraped out with stone tools and shells to create a hull. Captain John Smith reported seeing Cherokee canoes carrying as many as 40 warriors.

Fiber: The outer bark of the Tuliptree was crafted into berry baskets and larger pack baskets. It was also pounded and twisted into hunting belts that were worn on the waist. The inner bark was valuable for producing cordage and rope, useful for many things and essential in the construction of their seasonal houses and lodges. In the winter the Cherokee lived in homes constructed of woven saplings, mud and bark. In the summer they lived in open-air dwellings with bark roofs. All of these structures were bound together with rope and cordage.

Building Materials: The outer bark was cut into slabs and used for shingles and siding on shelters.

Hunting and Fishing: The outer bark was used to make quivers for arrows.

Tools: Twigs were used as fire drills.

Medicine: The Tuliptree was used extensively in Cherokee medicine: leaves were made into poultices to treat sores, inflammation, and headaches; seeds were pounded into a powder and taken as a laxative; scrapings from the inner bark were made into a tea for fevers, diarrhea, pinworms, snakebites, and rheumatic pain; the inner bark was also chewed as an aphrodisiac and to alleviate toothache; the outer bark was boiled into a thick syrup for coughs and de-worming; a decoction from the outer bark was blown through a tube onto fractured limbs, then dried and bandaged; a tea from the roots of saplings was used for digestive disorders. The Cherokee also used the inner bark to treat malaria. It was so effective that it was adopted by colonists and early American doctors as a substitute for the conventional quinine made from the exotic Peruvian Bark or Cinchona (*Cinchona officinalis*).

Food: Tuliptree flowers produce a nectar favored by honey bees who in turn produce a golden, amber honey prized by the Cherokee. Inner bark was dried and pounded into a flour.

Fuel: Tuliptree wood is excellent for creating friction fire, burning hot and quick but not producing long-lasting coals like other hardwoods.

Other: The soft hardwood was easily carved into spoons, bowls, pottery paddles, and canoe paddles.

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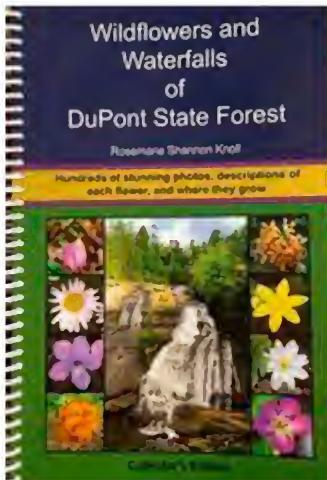


Book Review

Wildflowers and Waterfalls of DuPont Forest

by Rosemarie Shannon Knoll

Reviewed by Lucy Prim



Rosemarie Knoll, one of our newest Botany Club members, has written a book! It is titled "Wildflowers and Waterfalls of DuPont State Forest." I have had this book open on my kitchen table for a couple of weeks, looking at it several times a day, quizzing myself on the names of the plants. Like a pile of flash cards, it is serving as a good refresher, getting my brain in gear for the spring. Rosemarie has taken wonderful close up photos of some of our tiniest flowers. How enjoyable it is to see them in such stunning detail!

She has organized the flowers first by color and then by season. Every flower has its own page. At the top, we find a beautiful picture of the flower followed by a description of the plant and along which trails in DuPont we might find it growing. A few blank lines at the bottom of each page give us space to write in where and when we saw the flower ourselves.

On a very cold morning in early February, Rosemarie and I rendezvoused at Hooker Falls Parking at DuPont Forest to talk about her book. We sat in her pickup truck with her beautiful Golden Retriever, Charlie, and I asked her lots of questions about how and why she wrote this book. Rosemarie said she became inspired to do this project when she realized there wasn't an easy to use wildflower book just for DuPont Forest. She wished there were such a book and decided to make one for herself. What started out as a personal project evolved into a much grander endeavor when her friend suggested she actually create a real book. Never having written and published a book before, Rosemarie had to learn how to go about it. She had to buy a program, In Design, which allowed her to create the pages, put in the pictures and write the text. And she had to take all the photographs and do a huge amount of research.



I asked her what a typical day would be like. She would wake up early and after a quick breakfast, she would drive over to DuPont Forest (she lives about a mile away) and spend the entire day walking the many trails, her eye scanning the woods for flowers. She covered up to 10 miles a day, always accompanied by her trusty friend and protector, Charlie, who became so accustomed to the routine he knew to sit down patiently and wait whenever Rosemarie found a new flower to photograph. After a long day of walking and photographing, she'd go back home and right away start studying her pictures, working late into the night researching the flowers and deciding which pictures were good enough to use. For each flower she tried to take about 20 pictures so she would be sure to have a good one for the book. If she didn't have a good picture, she'd go right back the next day and take more pictures. If she waited, the flower might wilt

and she'd have lost her chance. It was a whirlwind year creating this book, but Rosemarie did it, and now it is for sale in 16 shops around here, including the Ranger Station and the Biltmore bookshop!



An Exciting Discovery Made by Rosemarie!

An exciting discovery of a rare plant was made by Rosemarie while she was creating her book! Here is her description of this discovery and what ensued, told by Rosemarie herself.

Whorled Pogonia in DuPont State Forest (*Isotria verticillata*)

by Rosemarie Knoll

The Friends of DuPont knew of one location in DuPont where there was a stand of *Isotria verticillata*, which is considered uncommon to rare in North Carolina. It is on the federally threatened or endangered list for a number of other states. I spent quite a bit of time walking the trails in DuPont last year. On one of my walks I found a second, unknown stand of *I. verticillata* along the edge of Sheep Mountain Trail. Unfortunately, it was only 25 yards from where they were harvesting white pines. Logging is an important revenue stream for DuPont and helps to keep the white pine under control, allowing other species to flourish. I was afraid that the stand of *Isotria* could be destroyed the next day since the logging truck was so close.

With the help of the Friends of DuPont, we contacted the Ranger with photos and information on the location of the plants. The Ranger responded immediately and was at the site the first thing the following morning. The logging was temporarily halted in that spot until the Department of Forestry came out and confirmed that it was indeed *I. verticillata*. The DOF also found several other stands of plants in the same area that were off the trial. That area is now off limits to logging and the plants will be preserved. I was glad to be lucky enough to happen on the spot at an opportune time and could do my part to preserve a rare species.



What's in a Name – *Catesbaei*

by Penny Longhurst

We don't see Catesby's Trilliums (*Trillium catesbaei*) very often, but when we do they always look so small and delicate compared to the other trillium species we are more familiar with. They were named after Mark Catesby, an English explorer and naturalist, who published a groundbreaking book describing and illustrating the flora and fauna of North America.

Catesby was born in 1683 in the village of Castle Hedingham in Essex, about 60 miles northeast of London. His father was fairly prosperous and owned property in London and Suffolk, which was left to his surviving children when he died. Thus, Catesby became independently wealthy. In 1712 he accompanied his sister, Elizabeth Cocke, and her children to Williamsburg, Virginia, where she joined her physician husband. Catesby stayed in Virginia for seven years, travelling throughout the vicinity of Williamsburg and up the James River towards the foothills of the Appalachians. Sadly, other than his books and drawings, very few of his papers exist today; we don't even know what he looked like! So there are no records of exactly where he travelled. In those days such expeditions into the wilderness were not without their perils. Without roads, or sometimes even trails, explorers ran the risk of getting lost or attacked by Native Americans. An earlier naturalist, John Lawson, who travelled throughout the Piedmont of the Carolinas, was killed by Tuscarora Indians in September 1711 while exploring upstream from New Bern along the Neuse River.

Although not formally trained as a botanist, Catesby had collector friends and he sent seeds, pressed and dried herbarium specimens, and plants in "tubs of earth" back to England. He also cultivated plants in his garden in Williamsburg. Reptiles, animals, and birds were dried or preserved in rum for the trip! Collections did not always make it safely across the Atlantic, often running the risk of capture by pirates or loss due to careless crew or storms. Nonetheless, many plants were successfully raised from his seeds in English gardens and nurseries, stimulating great interest in New World flora. Catesby was an accomplished water color artist and drew live specimens found during his travels. He noted that he never drew plants twice in the same season; thus he was able to show developmental changes with his observations. Catesby returned to London in 1719 hoping to return to North America in the near future.

English botanists were keen to obtain more specimens from the Americas. They and the new Governor of South Carolina sponsored Catesby to return and document the natural history of the Carolinas. He landed in Charles Town (Charleston) in May 1722. Initially he concentrated his studies on the surrounding low country regions. Subsequently he spent alternate summers in the low country or in the backcountry, travelling up the Savannah and Edisto Rivers. Although no records of his travels remain, the specimens he collected suggest that he travelled at least as far as Clemson and Keowee. For instance, his descriptions of Catesby's Trillium (*Trillium catesbaei*) and Sweet Shrub (*Calycanthus floridus*) include the text "This Plant I found at the Sources of great Rivers; not having seen any in the inhabited Parts of Carolina."

Among the bird species Catesby drew were the now-extinct Passenger pigeon, Ivory-billed woodpecker, and Carolina parakeet. He was one of the first to suggest that birds migrated. Prior to this time, it was



thought that birds, like swallows that disappeared in the winter, hibernated in crevices or in mud at the bottom of ponds! His observations of Dark-eyed Junco were that ‘*In Virginia and Carolina they appear only in Winter: and in Snow they appear most. In Summer none are seen. Whether they retire and breed in the North (which is most probable) or where they go, when they leave these Countries in the Spring, is to me unknown.*’ He also noted that Bobolinks migrated back and forth from the Caribbean islands to South Carolina in search of maturing rice crops. The introduction to Volume II of his ‘*Natural History*’ includes a list of birds that either spent the winters in the Carolinas and then disappeared or were there only in the summer.

Catesby spent most of 1725 sketching and gathering specimens in the Bahamas before returning to England and preparing to publish his observations. He never returned to the Americas. Because he would have to pay for publication of his book himself, he advertised for subscribers or ‘encouragers.’ It’s estimated that around 180 copies were sold, including one to John Bartram. ‘*The Natural History of Carolina, Florida and the Bahama Islands*’ was published in 10 parts of 20 plates each, plus an appendix, at a cost of 2 guineas (2 pounds and 2 shillings) each. Volume I consisted of 100 images of birds, frequently posed with the plants on which they fed or in which they lived. Volume II was divided into sections on fish, amphibians, mammals, and insects, often with related plants. Volume I, Part 1 was published in 1729, and the final issue, the appendix, in 1747. Catesby himself wrote an introduction for each volume, etched the illustrations from his sketches, and wrote the English text on the facing page for each plate. An anonymous ‘Doctor of Physick’ wrote the accompanying French translation. He probably had assistants help color the illustrations. The Latin names (the descriptive phrases used as species names before Linnaeus’ binomial system came into general use) were provided by the English botanist William Sherard. The ‘*Natural History*’ was the main source for naturalists and explorers, including Lewis and Clark, in the Americas for many years. Catesby’s drawing style influenced many subsequent field naturalists, such as William Bartram and John James Audubon. Interestingly, Linnaeus used several of Catesby’s plates as references when he published his binomial species names.

Catesby died in London in December 1749. Many of his collected specimens are in museums. His watercolors were bought by King George III in 1768 and are housed in the Royal Library at Windsor Castle. About 100 first edition copies of the ‘*Natural History*’ survive in private collections and museums, including the Smithsonian. A second edition was printed in 1754 and a third in 1771. German, Latin, and Dutch translations were also published. Occasionally copies come up for auction. If you can’t afford \$650,000 for a 1st edition, \$285,000 for a 2nd edition, or \$92,000 for a 3rd edition, digitized versions of the original volumes as well as updated electronic versions can be found on the internet. Catesby’s illustrated book ‘*Hortus Europæ Americanus, or, A collection of 85 curious trees and shrubs: the produce of North America, adapted to the climates and soils of Great-Britain, Ireland, and most parts of Europe*’ describing American trees he thought would grow well in Europe was published posthumously, in 1767. The Catesby Commemorative Trust has produced two movies about the life of Catesby which are available on Vimeo.

The genus *Catesbeia*, American Bullfrog (*Lithobates catesbeianus*), and the following plants were named in Catesby’s honor: *Calystegia catesbeiana* subsp. *catesbeiana* (Catesby’s Bindweed); *Calystegia catesbeiana* subsp. *sericata* (Blue Ridge Bindweed); *Clematis catesbyana* (Coastal Virgin’s-bower); *Gentiana catesbaei* (Coastal Plain Gentian); *Leucothoe axillaris* (Coastal Doghobble) formerly *L. catesbaei*; *Lilium catesbaei* (Catesby’s Lily); *Quercus laevis* (Turkey Oak) formerly *Q. catesbaei*; *Sarracenia × catesbaei* (*S. purpurea* × *S. flava*) (Catesby’s Pitcher Plant); *Silene catesbaei* (Fringed Campion); and, of course, *Trillium catesbaei* (Catesby’s Trillium).

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[Catesby Commemorative Trust](#)

[The Curious Mister Catesby video on Vimeo](#)

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Maples

by Lucy Prim

Acer rubrum—Red Maple



In the late winter and early spring, when the woods are still looking very wintry, the Red Maples bloom. The flowers are so small, at a distance they blur together looking like a red haze floating about the branches. I used to think the red haze came from the newly emerging leaves. But with a close look, the red haze is obviously not newly emerging leaves, but a dense cluster of tiny red flowers! If you look closely you can see the flowers are either male or female. Stamens sticking out all around means it is a male cluster and y-shaped stigmas sticking out mean it is a female cluster. Usually all the flowers in a cluster are either male or female, in some cases appearing on one tree together and in other cases on separate trees.

After wind pollinates the flowers, the exquisitely colored fruit, samaroid schizocarps, appear, dangling gracefully from slender stems, eventually breaking free in the breeze and spinning and tumbling to the ground in the most delightful,

spiraling descent.

The Red Maple, *Acer rubrum*, is one of our most common trees, not only here in our mountains, but across all of eastern North America. Because of fire suppression, which started in the 1920s, Maples have become much more common than they had been before. They can tolerate a greater variety of conditions than any other tree, according to Jennifer Frick-Ruppert in her book “Mountain Nature!”, thriving in wet areas with the roots completely submerged in water and also on high elevation mountain sides.

There is another variety of Red Maple, *Acer rubrum* var. *trilobum*, most commonly found on the Coastal Plain but sometimes found here in our area. As to be expected, this variety has three lobes or even no lobes at all. It also has smaller leaves with a rounded or cuneate base, while *Acer rubrum* leaves usually are cordate at the base.

Acer pensylvanicum—Striped Maple

We often see *Acer pensylvanicum*, Striped Maple, on our walks. Its green-striped trunk makes it easy to identify. Associating the word “pensylvanicum” with pencils and stripes will make it easy to remember its botanical name.

The yellowish green bell shaped flowers are perfect, both male and female, and hang from their branches in graceful arching racemes.

The finely toothed leaves are the largest of all the maples in eastern North America, though the tree itself is one of the smallest maples.



Acer saccharum—Sugar Maple

Sugar Maple, *Acer saccharum*, is another maple we see here, though not as commonly. Look for the rounded leaf sinuses, as Alan Graham has so often pointed out to us, and that will tell us it is Sugar Maple. I remember this by thinking how the sinuses are curved like a sugar bowl. Red squirrels chew the bark of branches to create wounds, and they come back later to lap up the sugary sap.



Mountain Maple—*Acer spicatum*

Mountain Maple thrives in cold northern areas, growing as far north as Newfoundland. We are close to its southernmost range, the mountains of north Georgia, and we only see it when we go to higher elevations, up by the Parkway.

The leaf of *Acer spicatum* has very big, coarse teeth, a feature that can help distinguish it from Striped Maple whose teeth are quite tiny.

The panicle of pale yellow green, wispy flowers, arch up and out from their branches. (When Susan Sunflower sees this erect panicle, she says to herself, “Mountain up!” and that reminds her it is Mountain Maple!) The flowers contain both male and female structures, but one or the other is dominant, and the other non-functional. The pistillate flowers and staminate flowers occur on the same plant and they appear after the leaves are out. First the male flowers come out, then the female flowers, then more male flowers.

Insects, not the wind, pollinate Mountain Maples. But most reproduction is done vegetatively. New trees sprout from underground stems, and branches bending low to the ground sprout roots. Crowded colonies of Mountain Maples come into being like this, and we can find them in the woods as an understory shrub growing in deep shade or as the canopy tree on a sunny mountain top.



How should we pronounce the word “Acer”?

According to “Stearn’s Dictionary of Plant Names for Gardeners,” if we follow the Reformed Academic pronunciation, we would pronounce the “A” as in father, and the “C” as in cat. If we follow Traditional English we would pronounce the “A” as in fate, and the “C” as in center.



Mesophication and Maple Trees

I first heard about “Mesophication” this winter, from our indoor speaker Peter Bates. It is a new word, coined in 2008 by Nowacki and Abrams in their article “The Demise of Fire and ‘Mesophication’ of Forests in the Eastern United States.”



For 4,000 years, Indians and then Europeans have been starting fires in this area. Indians practiced yearly burning to clear areas for their crops and to encourage grasses that fed their game animals. These frequent fires led to the growth of sun-loving, fire-tolerant, and adaptive species such as Oaks, Grasses, and Pines. When fire suppression measures were adopted in the 1920s, a series of events began to take place. Maples and other fire-sensitive trees began growing in greater abundance. As they grew unchecked, their leafy branches spread out and shaded the forest floor, keeping it from drying out in the hot sun. Maple leaves, moister than Oak leaves, accumulated on the forest floor creating even more moist conditions. The shady, moist, nutrient rich soil beneath Maples creates the right conditions for the fewer in number shade loving, fire-sensitive plants but not for our great many sun loving, fire-tolerant plants. And this means we have a loss of species diversity. “Mesophication”—what an interesting concatenation of circumstances this is.



On Weeding

by Larason Lambert

Weeding undesirable plants from amongst our botanical treasures is a laborious task. I spend a lot of time pulling weeds at Fernhaven, and the following summarizes what I've learned over the years. Much of it is just common sense which many of you will already know, but I figured it was worth putting this experience down on paper for informational purposes, so here goes.

Most successful weed species tend to break off when pulled if not gripped at the base. I have found it beneficial to keep a trowel handy. You will quickly learn which species are likely to require a trowel for removal, and not even try to remove them without the trowel. As the soil becomes drier, the use of a trowel becomes even more necessary. Plants with taproots seem to be particularly prone to breaking off, and the taproots of some species can be quite deep. Such plants will just send up new sprouts if the roots are not dug up. In digging these taprooted weeds, I insert a trowel into the ground parallel to the taproot on one or more sides of the taproot to cut off side roots before working the taproot loose with the trowel.

Other weeds such as Cowbane, Wild Yam, and *Prenanthes* have small tubers attached to the roots, which if they are not dug up, will send up new sprouts. Cowbane is particularly difficult to remove—even though the tubers are very shallow. The plant breaks off very easily and should not be pulled even gently. It's helpful to learn the rooting characteristics of the weeds you're pulling.

When ground coverage by desirable species is dense, some weed species still poke their heads through, and it can be difficult to locate the bases of the weeds and pull them. I have found that a good approach is to exert a slight tension on the weed with one hand and reach down in with the other to find the base of the weed. A similar approach may be necessary when pulling weeds coming up through a thick cover of leaves, especially on a slope, where the base of the weed may often be six inches uphill.

With a dense cover of desirable plants, you might inadvertently pull some desirable plants when trying to pull weeds from amongst them. Such collateral damage is almost inevitable in some cases, but just try to minimize it. Hog Peanut is a particularly problematic weed in this respect because it's very fine vines twist

around other plants as it grows up through them, making damage unavoidable. It may not be feasible to pull all undesirable plants if they are small and way down amongst the desirable plants. You should do the best you can, keeping in mind that whatever weeds you do not eliminate will grow and need pulling later.

Pulling weeds from thin soil on rock surfaces must be done with care so as not to disturb nearby desirable plants. You should hold the root mass in the thin soil down with one hand while pulling the weeds with the other. This situation also applies to roots coming up through moss layers on rock surfaces.

On Bonnie Arbuckle's advice, I consider weeding activity as "selective weeding," wherein desirable plants are left and encouraged to occupy the ground surface more fully. Likewise, native groundcovers that you have planted will spread and be disseminated to other areas. This cultivation of desirable native groundcovers will gradually discourage further weed growth, as will conscientious, timely weeding to prevent seed dissemination by annuals.

There are some professional gardeners who argue that you should not pull weeds from amongst your desirable plants because it will disturb your desirable plants' root systems. They advocate just cutting out the weed and letting the desirable plants then out-compete the weeds, likely a rather debatable approach.

Some of the plants I consider to be weeds may be adored by other folks, and there are other somewhat attractive plants at Fernhaven which I consider as weeds in some locations. They just don't aesthetically go well with ferns in some cases, and appearance is an important aspect of gardening: One man's weed is another man's wonder. Or, alternatively: a weed is just a plant out of place.



Working for Mother Nature at Fernhaven

by Larason Lambert

I work with Mother Nature, or perhaps I work for her.
It seems she's always working, and no breaks do e'er occur.

She's always finding tasks for me; my work seems never done.
But as I go about these tasks, I often call it fun.

What better purpose can one have, than tending to the land.
Without good land, all hope is lost. This is where we must stand.



Hepatica's New Name

by Lucy Prim



We have another name change! Two of our earliest and loveliest wildflowers, *Hepatica americana* and *H. acutiloba*, have been moved to the genus *Anenome* and are now called *Anenome americana* and *A. acutiloba*. Alan Weakley says that in our area these two are entirely distinct species and do not seem to hybridize.

Hepatica's three lobed, purplish-brown leaves reminded many people around the world (Asians, Greeks, American Indians, and Europeans,) of the liver, leading them to believe that Hepatica had the ability to restore a diseased liver. Jack Sanders, in his book, "The Secrets of Wildflowers," relates how two tons of Hepatica leaves were imported from Europe in 1883, dried, and made into a liver tonic!

I found a little clump of Hepatica blooming in my woods in the beginning of February. I dug them up and brought them inside and have been watching and sketching them for a few weeks. I watched the flowers uncurling from the base, rising up on slender stems that grew taller and taller, the soft lavender petal-like sepals opening wide and beckoning. But what little insects will come calling? Because the flowers open so early in the year, there are not many pollinators flying about, and to make sure seeds are produced, some of the flowers have the ability to self fertilize. After a few days, the petal-like sepals wilt and wither and the long hairy stems arch and droop over until they touch the ground, making it easy for an ant to get to the seeds. As soon as the flowers are all wilted, very fuzzy new leaves began unfurling from the base. Hepatica leaves remain all year long, facing up toward the sky, catching whatever light they can from between the branches and leaves overhead.

SHORTIA
c/o Lucy Prim
48 Oak Gate Drive
Hendersonville, NC 28739

FIRST CLASS

SHORTIA

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Proof-reader: Dave Lellinger

The purpose of the Club is to study the plants of the southern Appalachian Mountains and the Southeast through field trips and indoor meetings. **Membership is open to all.** Individual/family memberships are \$15. New members joining from the period July 1-December 31 pay \$8. All memberships are renewable on January first of each year. Send dues to Alan Graham, 42 Autumn Glen Court Brevard, NC 28712.

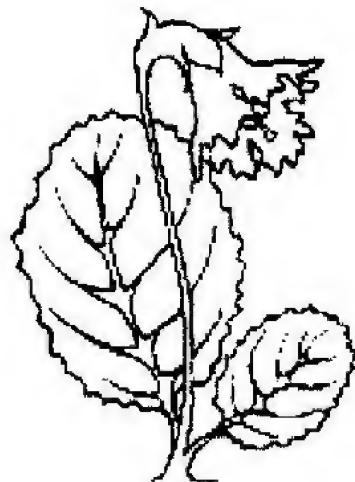
Please send me Botanical Articles or stories or tips on plant identification that you think would be good to include in one of our SHORTIAs. If you see anything that needs correction or if you have additional information about a subject or perhaps a personal experience related to a subject, send that in too, and I can include it in a future SHORTIA. Please try to get this to me by the last week of May to get it into the Summer issue.

SHORTIA

NEWSLETTER OF THE

WESTERN CAROLINA BOTANICAL CLUB

Summer 2018



Shortia galacifolia

Oconee Bells

President	Susan Sunflower	Secretary	Mary Standaert
Vice-President	Gayle Mercurio	Treasurer	Alan Graham
Members at Large	Joe Standaert and John Harrison		

MEMBER NEWS

Field Trip Cancellations: Occasionally, field trips must be cancelled or changed either for weather conditions or other reasons such as road closings. Such changes are sent out by email to all members by 7 AM the day of the field trip. If you do not have email access, please call the leader, co-leader, or recorder (whose phone numbers are listed on the schedule) to be sure that the walk is going to go as planned. Indoor programs are cancelled when Henderson County Schools are closed (see <http://www.hendersoncountypublicschoolsnc.org>) but NOT necessarily cancelled because of delayed opening.

For any change of address, email or telephone number, please inform Alan Graham, 42 Autumn Glen Court, Brevard, N.C., 28712. 828-884-3947 —— adgraham@comporium.net.



President's Message

by Susan Sunflower

Spring Green

After our erratic winter, some months warm and others really cold, we finally had late spring blooms, all too soon washed away by heavy rains, almost monsoons. Rains to date in Western NC are over 30" above average for the year, and it's only May.

Here at my house, I've been admiring the lush foliage and hues of green billowing branches, of leaves spilling out of trees and shrubs, of grasses and ground covers. All the green shades of ferns and other leafy things fall onto the walkways, having a lovely time filling up more space than I've seen them do before. The colors of green were most intense the first week or two of May, all shades and hues of pale to strong green, chartreuse, apple green, emerald and ... So what is 'green'?

Leaf 'green' is due mostly to a pigment called chlorophyll. We know it absorbs energy from light and thus helps plants get food. What I learned was that chlorophyll is of 6 different types: a, b, c1, c2, d, f; each having a different molecular formula. Plants mostly have two types of chlorophyll in them: type "a" and

type “b”. Chlorophyll “a” is teal-green in color, chlorophyll “b” is yellow-green. Combinations of these types of chlorophyll provide different shades of greens.

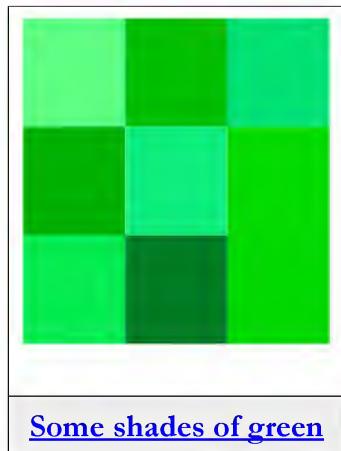
Especially for new leaves, plants in full sun have more chlorophyll “a” and thus have a lighter shade of green. Plants which grow in the shade have chlorophyll “b” in abundance, an adaptation for capturing low intensity light. The leaves are darker in these plants, as compared to those which grow in sunlight.

Other factors influence color: Young leaves are still developing cell walls and the full photosynthesis ability, so have a lighter shade of green than adult leaves.

Leaf design/structure counts. Thicker leaves are either juicy (**succulent**) as in a cactus or non juicy as in Eucalyptus leaves, which are thick and are darker green because they have dense chloroplasts which absorb sunlight and have low reflectance. The succulent leaves tend to be lighter as their cells are quite watery, and thus the concentration of chlorophyll on the surface is less—like stone crops!

A web sampling of ‘green’ lists a variety of hues. No doubt more are added daily!

Shadesofgreen.facts.co has 160 shades, from Beryl and Bice through Wintergreen to Zomp. Wikipedia lists ‘only’ 70 shades, from Artichoke to UP Forest Green. Here’s Wiki’s ‘green’ chart:



The greens in my garden are even better, yours too, no doubt! In spring, we may have to look fast and often, to catch the changes.



Thalictrum

by Lucy Prim

How delightful *Thalictrums* are with their softly lobed, blue green leaflets. Alan Weakley says in his “Flora of the Southern and Mid-Atlantic States” that *Thalictrum* is considered a “difficult” genus. Several of our native *Thalictrums* look confusingly alike. Of the 7 or 8 species in our area, two, *Thalictrum thalictroides* and

T. clavatum, are very distinctive and will not confuse us. But the remaining 4 species have similar features and might be confused, especially since their sizes and blooming periods overlap. I have made a chart which may help us make a good guess as to which is which. It turns out, trying to identify *Thalictrums* is great fun!

Thalictrum thalictroides, the earliest blooming of our *Thalictrums*, grows only 10 inches tall. The gleaming white to pale pink sepals circle around a cluster of bright yellow tipped stamens, their deceptively dainty appearance belying their ability to withstand strong frosts. I was surprised to learn that the little seedlings take 3 or more years to flower.

Thalictrum dioicum, Early Meadow Rue, blooms from March to May and grows 1–2 feet tall. It is dioecious, with male and female flowers on separate plants. The male flowers are the showiest, their long stamens and yellow anthers dangling down in drooping clusters.

Lady Rue, *Thalictrum clavatum*, is the next to bloom. It grows in rich forests beside streams or seeps. It blooms from May to July and grows up to 24 inches. The flowers are perfect, and their dainty stamens radiate out to form airy spheres only 1/3 inch across. “*Clavatum*” means “club shaped” and refers to the filaments which widen toward the tip and meet with the little white anther.

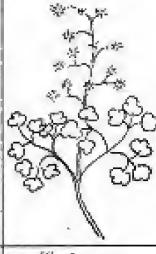
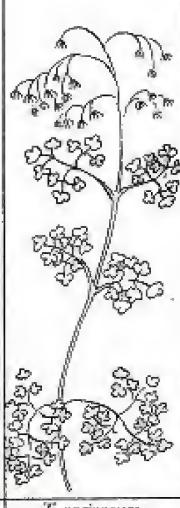
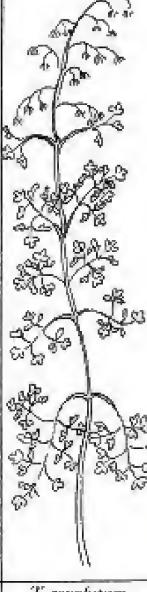
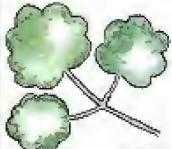
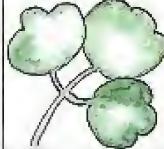
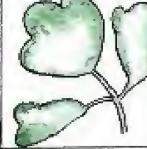
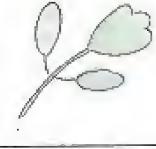
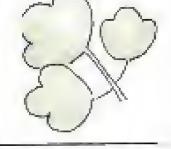
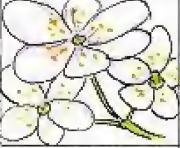
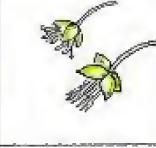
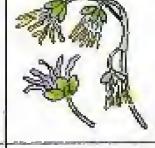
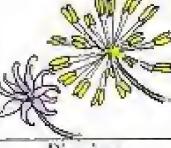
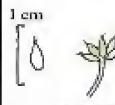
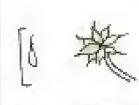
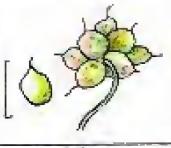
Thalictrum coriaceum, Leather Leaf Meadow Rue, could be confused with *T. dioicum*, both being dioecious and having male flowers with drooping stamens and yellow anthers. How can we tell them apart? *Thalictrum coriaceum* tends to grow taller, from about 2–3.5 feet and it blooms later, from May to July. Other clues: the roots of *T. coriaceum* are a bright yellow, the petioles are relatively shorter, and the leaf below the lowest flowering branch is sessile.

Thalictrum revolutum, Skunk Meadow Rue, can grow quite tall, up to 5 feet. It blooms May–July and looks similar to Tall Meadow Rue. One difference is that the leaves have a very pungent smell. The margins of the leaf curl under a little bit, and if you look very closely with your magnifying glass at the underside of the leaflet, you can usually (not always) see tiny little glands, giving the back a spider-webby appearance. One more clue is that the flower stamens of *T. revolutum* droop, while those in *T. pubescens* the stamens radiate out in all directions.

The rare *Thalictrum macrostylum*, Small Leaved Meadow Rue, blooms May–August and can be found in moist to dry locations. Its very tiny, glabrous, and mostly entire leaflets help differentiate it from other Rues. Patrick McMillan has found this rare *Thalictrum* growing at Table Rock State Park.

Thalictrum pubescens, Tall Meadow Rue, blooms later in the summer, June–August, and can grow surprisingly tall, up to 7–8 feet. How amazing it is to think that this very tall plant is in the same family as the tiny Rue Anemone we’d seen just a few months before! Most of the flowers are either male or female, though some are bisexual, and male and female may be on the same plant. The club shaped filaments, tipped with yellow anthers, radiate out in all directions giving a star-like quality to the flowers.

Thalictrums

7'						
6'						
5'						
4'						
3'						
2'						
1'						
						
<i>T. thalictroides</i> Rue Anemone	<i>T. dioicum</i> Early Meadow Rue	<i>T. elevatum</i> Lady Rue	<i>T. cordatum</i> Leather Leaf Meadow Rue	<i>T. revolutum</i> Skunk Meadow Rue	<i>T. macrostylum</i> Small Leaf Meadow Rue	<i>T. pubescens</i> Tall Meadow Rue
March - May to 12"	March - May to 2.5'	May - July 2"	May - July 2" - 3.5"	May - August 2" - 5"	May - August 3" - 6.5"	June - August 3" - 7"
						
Leaflets usually 3-lobed 1 - 2.5cm wide	Leaflets 3 - 9 lobes 1 - 5cm wide	Leaflets 3 - 7 lobes 1 - 4cm wide	Leaflets usually 3 - 9 lobes 1 - 6cm wide	Leaflets usually 1 - 3 lobes, .5 - 3.5cm wide Pungent smell	Leaflets usually entire, some up to 3-lobed .5 - 15mm long 3 - 12mm wide Glabrous beneath	Leaflets usually 3-lobed 15 - 35mm long Hairy beneath
						
5 - 10 Sepals White-pale pink 5 - 18mm long	Dioecious Anthers 1.5 - 3mm long Stigmas 1.5 - 2mm long	Perfect flowers 8.5mm across Stamens club-shaped	Dioecious Anthers 3 - 4.5mm long Stigmas 1.5 - 3.5mm long	Dioecious Anthers 2 - 2.5mm long Stigmas 1.5 - 3.5mm long	Dioecious Anthers 1 - 1.5mm long Stigmas 1.5 mm long	Dioecious Anthers 4.5 - 5.5mm long Stigmas 1.5 mm long
1 cm						
						
Achenes 3.5 - 4.5mm long 1 - 1.5mm wide	Achenes 2.5 - 3mm long 1.5 - 2mm wide	Achenes Flat, scimitar-shaped 3 - 6mm long	Achenes 3.5 - 4mm long 1 - 1.5mm wide	Achenes 3 - 5mm long 1.5 - 3mm wide	Achenes 3 - 3.5mm long 2 - 3mm wide	Achenes 4.5 - 5.5mm long



Cypripedium Orchids

by Penny Longhurst

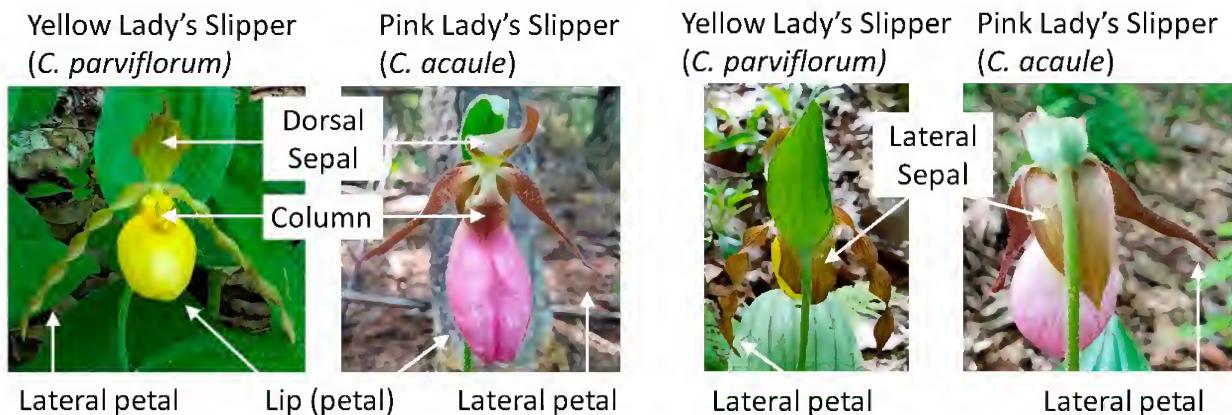
Spring flowers are all wonderful, but one that club members seem to enjoy seeing the most is the Yellow Lady's Slipper orchid (*Cypripedium parviflorum*). Its bright yellow slipper, pale green pleated leaves, and intriguing spiraling "twisties" are unmistakable. Pink Lady's Slipper (*Cypripedium acaule*) is fairly common; on a recent hike in DuPont State Forest Lucy and I came across two colonies, each probably containing 50 plants and growing within 100 yards of each other. In contrast, *C. parviflorum* is elusive; even when we know where to find the plants we always seem to wander around in the woods for a while before we spot the right location! Recently I obtained a copy of Stanley L. Bentley's book "Native Orchids of the Southern Appalachian Mountains" and was fascinated by his descriptions of the Cypripedium orchids. It encouraged me to go out and look more closely at these beautiful plants.

Cypripedium acaule has 2 basal leaves (*acaule* means stemless) while *C. parviflorum* has several leaves that grow up the stem. *Cyprepedium acaule* plants almost always have only a single flower, but *C. parviflorum* may have two flowers lined up, one above each other. Apparently this is quite common with the Lesser Yellow Lady's Slippers (*C. parviflorum* var. *parviflorum*), but less frequent in Greater Yellow Lady's Slippers (*Cypripedium parviflorum* var. *pubescens*). All Cypripedium flowers have 3 petals, although the one that we mostly notice is the slipper, the large pouch-like colored lip or *labellum*. The two lateral petals are the (usually) brown ribbon-like structures on either side of the slipper; as mentioned above, those of *C. parviflorum* are twisted into a spiral. There are also 3 sepals; the dorsal sepal is suspended between the lateral petals above the slipper and keeps water out of the pouch. In both *C. parviflorum* and *C. acaule*, the 2 lateral sepals are fused forming a "synsepal", located above and behind the slipper (see picture).

Reproduction in orchids differs from that of most of the other plants we are familiar with. The female parts (ovary, style, and stigma) and two fertile stamens (male parts consisting of a filament and an anther) are fused into an organ called the column or *gynostemium*, located at the top of the slipper (see picture). On each side of the column is located a sticky mass called a *pollinium* that contains pollen. In *C. acaule*, bees that push their way through the slit in the front of the slipper in search of nectar become trapped inside. Their only exit is through a tight passage to a small hole located next to the column. As they push past the column, pollen from neighboring plants is removed. Then the pollinia attach to the bee and are transferred to the column of the next plant. You can see photographs of a bee escaping from a *C. acaule* flower on [Jim Fowler's flickr account](#).

In *C. parviflorum*, the hole in the slipper is much larger, but the margins fold inside and the inner surface is slippery preventing escape. Spots inside the slipper may act as false nectar guides, attracting and trapping bees. Once inside, tightly packed hairs at the bottom of the slipper lead insects past the column and then the pollinium on their way out.

Cypripedium orchids are deceptive, non-rewarding species, producing no nectar and attracting insects only because of their bright colors and sweet scent. It's been estimated that fewer than 10% of Lady's Slippers produce viable seeds each year. Pollinating insects (usually bees) are thought to avoid them after a few unproductive attempts to feed, which probably accounts for their very low sexual reproduction rate. Fortunately Cypripedium plants are rhizomatous and vegetative reproduction by branching of the rhizomes is thought to be their main method of reproduction. Our inability to find known plant locations may be due to the ability of orchids to go dormant and only reappear after a few years, rather than our own forgetfulness! The symbiotic relationship between mycorrhizal fungi and the rhizome may sustain it during dormancy periods when it is unable to photosynthesize. During that period the rhizomes are thought to continue to grow and will hopefully produce new plants for us to find in future years.



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[Jim Fowler.. Pollination of Cypripedium acaule \(Pink lady's-slipper orchid\) by a Bombus species \(Explored 4-8-2012\) on flickr.](#)

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Smooth Rock Cress and Sicklepod

by Lucy Prim



Common Smooth Rock Cress, *Boechera laevigata*

Smooth Rock Cress, *Boechera laevigata*, is a strange looking plant, and we don't see it often on our Botany Club walks. This spring I have come upon it twice, once as we began our walk at Connestee, and once on a walk I took down Buck Spring Trail from the Pisgah Inn. Each time I was startled by the odd, gray green color of the stems and leaves.

According to the map in Weakley's Flora, of the eight *Boechera* species in the South East, there are two we are most likely to find in our area, Common Smooth Rock Cress, *Boechera laevigata*, and Sicklepod, *B. canadensis*. I have found two lovely Sicklepods this spring, one up by Rattlesnake Lodge and another on the Mountains-to-the-Sea Trail, coming down from Wagon Road Gap. It is strange how we come upon these plants so seldom, and when we do, we don't find them clustered together in groups, but only one by itself and we can walk for many miles and not see another one.

Our two native cresses are easy to tell apart. *Boechera laevigata* is a very odd color, a gray, purplish green, and the siliques curve up and down in a graceful arching pattern. *Boechera canadensis* is a normal, fresh green color, and the siliques droop straight down. There is one other native Cress, *Boechera burkii*, which has leaves that are not at all auricled at the base. It grows in dry rocky habitats, and from Weakley's map, it looks to me like we probably won't find it nearby.

What are "siliques"? They are a type of fruit which has two fused carpels and are three or more times long as wide.

What are "Cresses"? "Cress" is the common name for



Sicklepod, *Boechera canadensis*

members of the Mustard Family, *Brassicaceae*. According to Wikipedia, there are 4060 species in this family. They all have 4 petals, 4 sepals, and 6 stamens. The 4 petals are in the shape of a cross, which is the reason for the older family name, *Cruciferae*. The origin of the word “cress” goes back to Old English and Old German.

Most of the Cresses we come upon in our daily life are from Europe. I am inclined to not like them and I pull them out of our garden rather than study them and try to learn their names. But these two native Cresses, so seldom seen and so curious looking, never fail to fill me with surprise and delight.



What's in a Name – *Fraseri*

by Penny Longhurst

When I sit on my deck and gaze out into the great blue yonder, one of the things that catches my eye is a large Fraser Magnolia (*Magnolia fraseri*). First thing in the spring its buds start to swell, then the large white flowers appear followed by the red seed pods and, finally, they burst revealing the orange seeds hidden within. So who was Fraser?



A prodigious collector, John Fraser introduced about 220 new species of American plants to Europe, undergoing numerous hardships and catastrophes along the way! He was the son of a farmer, born near Inverness, Scotland in 1750. Around 1770 he moved to London, bought a house in Chelsea, and set up a draper's shop. Its location was close to the Chelsea Physic Garden which he visited often, becoming friendly with the curator and his staff and developing an interest in plants. In 1778 he married, but soon after sailed for Newfoundland, spending the next 4 years exploring and collecting unusual plants, only returning to London in 1784. He soon set off again, this time to Charleston, SC, where he again collected plants and sent them back to England. In Charleston he met and befriended the American botanist, Thomas Walter. Walter had written a book “*Flora Caroliniana*” based on the plants he saw within a 50 mile

radius of his home. Fraser took the manuscript with him on his next trip to London and arranged for it to be published in 1788.

Between 1789 and 1809 Fraser returned several times to the southern states, including to “Indian country”. On his last two trips he was accompanied by his oldest son, John. In the summer of 1789 he travelled to Roan Mountain, and was the first European to collect *Rhododendron catawbiense* plants which he sold for 5 guineas each on his return to England. During that trip he encountered André and François Michaux, who were also exploring that area. Although the plants we most commonly associate with Fraser are the Fraser Magnolia (*Magnolia fraseri*) and Fraser Fir (*Abies fraseri*), other American plants he introduced into Europe include *Pieris floribunda* (Mountain Fetterbush) and Menziesia, as well as several Azaleas, Kalmias, Vacciniums, Oaks, and Pines.

Fraser’s life was not without its mishaps and problems! Most of the plants he shipped back to England after his first trip to Charleston died and he was not paid for his troubles, resulting in a long and drawn out lawsuit. Maybe as a result, in the 1780s Fraser started his own “American Nursery” at Sloane Square in Chelsea. Fraser and his younger brother, James, established nurseries in Charleston where they could transplant and grow their plants before shipping them to England. They also sent bulbs, seeds, and plants from their London nursery to Charleston to be sold in the American market. Here again troubles befell them, including mortgage default, lease problems, and other financial difficulties. In fact, in 1800 their partnership was dissolved and in 1809 John Fraser was even sued by his brother in the Charleston County Court of Common Pleas!

He also had bad luck with ships. In 1800 John Sr. and John Jr. sailed from England to the Americas via Cuba. Sometime after they left Havana their ship was wrecked on a coral reef 40 miles from land. It took six days before they were rescued by a Spanish boat and returned to Cuba. Then two years later when returning to England, Fraser’s ship sprang a leak and was forced to land at New Providence in the Bahamas for repairs.

Starting in 1795, Fraser became a botanical collector for the Royal Court of Russia, providing plants for the Empress Catherine II (Catherine the Great), her son, Czar Paul I, and his second wife, Maria Feodorovna. However, while Fraser was away in America in 1801, Paul I was assassinated and the new Czar, Alexander I, refused to pay him when he returned to Russia with his next collection of plants. This resulted in a diplomatic squabble and it took several years before he received any compensation.

On his seventh and last trip to Charleston in 1807 Fraser fell off his horse and broke several ribs. Apparently he never completely recovered from this accident and died in 1811. Even after his death his financial problems continued and his estate was declared bankrupt in 1813. John Jr. continued to operate the “American Nursery” until 1817, after which his share was sold to his younger brother, James Thomas.

Frasera, a genus in the Gentian family, was named by Thomas Walter in honor of Fraser.. *Frasera carolinensis* (American Columbo) is the only member of the genus found in our master plant list. *Frasera* species are short lived perennials. *Frasera carolinensis* exists as a basal rosette for years before sending up a flowering stalk and then dying, which probably explains why we don’t see it very often. Other plants named after Fraser that are found on our lists are *Abies fraseri* (Fraser Fir), *Cymophyllum fraserianus* (Fraser’s Sedge), *Lysimachia fraseri* (Fraser’s Loosestrife), and, of course, *Magnolia fraseri* (Fraser Magnolia).

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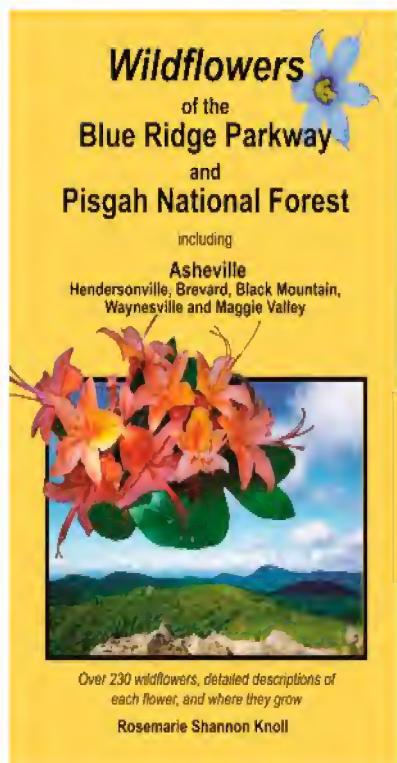


Book Review

Wildflowers of the Blue Ridge Parkway and Pisgah National Forest

by Rosemarie Shannon Knoll

Reviewed by Lucy Prim



Rosemarie Knoll has written another book! It is titled, “Wild Flowers of the Blue Ridge Parkway and Pisgah National Forest.” Once again, I am marveling at the beautiful pictures on every page. There are clear, informative descriptions of each flower and suggestions as to when and along what trails we can find the flowers blooming. I have been learning so much as I page through her book. For instance, I never before realized how surprisingly alike the flowers of Spring Beauty and Mountain Woodsorrel look. Rosemarie has them on facing pages so we can see them side by side, and the similarities are amazing. She sometimes anticipates confusing similarities, such as when she puts Wild Strawberry and Mock Strawberry on the same page, pointing out the differences. She has also included many pictures of seeds and leaves, which are not only interesting to study but of great help with identification. She has found some flowers in the Pisgah Forest that I have never seen before, some of which are pictured below.

I invited Rosemarie over for tea one afternoon so we could talk about her new book. She told me what an enormous push it was to get her book out in time for this spring’s wildflowers. For about two years she made countless trips into the Pisgah Forest, taking thousands of wild-flower photos. Then it took an additional eight months of working full time to organize the photos, identify all the flowers, and write the text. It was an exhaustingly intense push to finish in time for the spring publication. During the last eight months, Rosemarie told me she would

wake up in the morning and right away start in, working straight through to evening, no weekends off, barely taking time for meals and trips to the market. It was exhausting, but she did it.

Now she is reaping the rewards of all that hard work. The book is completed and for sale in shops all around this area, including the Pisgah Inn, where sales are very brisk. They have just ordered 100 copies after quickly selling the 20 copies she left with them a few weeks ago. So, three cheers for Rosemarie and three more cheers for her informative and beautiful book!



Location of Some of the Uncommon Plants in Our Area

by Rosemarie Knoll



Fireweed (*Chamerion angustifolium*) can be found at the beginning of the trail to Sam Knob. This is on Sam Knob Trail that heads uphill past the bathrooms at the parking area. The plants are not on Flat Laurel Creek trail that heads across the meadow. It blooms from July to September.



Kidneyleaf Twayblade (*Neottia smallii*) can be found along High Falls Trail in DuPont State Forest and in the woods along the trail to the high meadow at Craggy Gardens. It blooms from April to June.

Rosepink (*Sabatia angularis*) can be found along the roadside on Forestry Road 475 past the Fish Hatchery before you get to Cove Creek Campground. It blooms from July to September.



Rosemarie Knoll's Thoughts in Her Own Words



The first goal of my second book, “Wildflowers of the Blue Ridge Parkway and Pisgah National Forest” was to create a local version of the book “Great Smoky Mountains Wildflowers” by Campbell, Hutson and Sharp. The Smoky Mountains book has been a great resource for a number of years and has been used by many people. The limitation of this book is that it mentions the trails in the Smokies where you can find the flowers but does not cover the trails in our area. My new wildflower book covers our geographic area from the highest point on the Blue Ridge Parkway to the south up to Craggy Gardens Pinnacle to the north. There is not another wildflower book that covers our area and the trails in the Pisgah National Forest.

The process of creating a local book taught me many things about our area and ended up leading to what became the second goal of the book... to encourage people to learn about this unique area and hopefully create a passion for preserving our ecosystems.

One of the biggest lessons that I learned in putting together this second book was how delicate the ecosystems are that support many of our native wildflowers. How many times have we seen a flower, shrub, or tree in one location and nowhere else? Many of us in the Western Carolina Botanical Club have hiked miles and miles of trails throughout this area. We can all think of plants that are only found in very specific locations. Should these locations be changed or altered, we could lose these species.

It is inevitable that the ecosystems in this area will be altered in the future by climate change, disease, construction of roads, trails, homesites, reservoirs, as well as through the introduction of non-native species which will compete with our native species.

My hope in writing this second book was to give something back to our community and hopefully be one more voice in trying to preserve this beautiful and diverse area.

Here are a few examples of wildflowers that grow in limited areas and may be at risk of disappearing:

Blue Ridge Catchfly (*Silene ovata*), Greater and Lesser Yellow Lady's Slipper (*Cypripedium parviflorum* and *C. parviflorum* var. *pubsescens*), Kidneyleaf Twayblade (*Neottia smallii*), Greater and Lesser Purple Fringed Orchid (*Platanthera psycodes* and *P. grandiflora*), Small Whorled Pogonia and Whorled Pogonia (*Isotria medeoloides* and *I. verticillata*), Rosepink (*Sabatia angularis*), and Fireweed (*Chamerion angustifolium*).



Kalmia carolina



June 4, Rosemarie and I went to DuPont Forest to see *Kalmia carolina* in bloom. This was shortly after our many days of rain and we'd received emails from the rangers telling everybody that the smaller trails at Dupont were closed. But Corn Mill Shoals was open, and we set off down the path on a beautiful bright sunny afternoon, the sky deep blue and a soft cool breeze sweeping through the woods as we walked along. We turned onto Little River Trail and came to a broken down wooden bridge. It was much too dilapidated to try to walk across so we waded across the creek, cool clean water up past our knees, Rosemarie's dog Charlie right beside us, very happy to plunge in and get all wet. Then we continued on to Cedar Rock Trail where we walked up the path a little way and found the Sheepkill plants with their darling little flowers. We were so excited to see them. Surprisingly enough, these plants are quite common on the coastal plain of North Carolina, absent altogether from the Piedmont, and rare in the mountains!

SHORTIA

c/o Lucy Prim

48 Oak Gate Drive
Hendersonville, NC 28739

FIRST CLASS

SHORTIA

A quarterly publication of the Western Carolina Botanical Club

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Proof-reader: Dave Lellinger

The purpose of the Club is to study the plants of the southern Appalachian Mountains and the Southeast through field trips and indoor meetings. **Membership is open to all.** Individual/family memberships are \$15. New members joining from the period July 1-December 31 pay \$8. All memberships are renewable on January first of each year. Send dues to Alan Graham, 42 Autumn Glen Court Brevard, NC 28712.

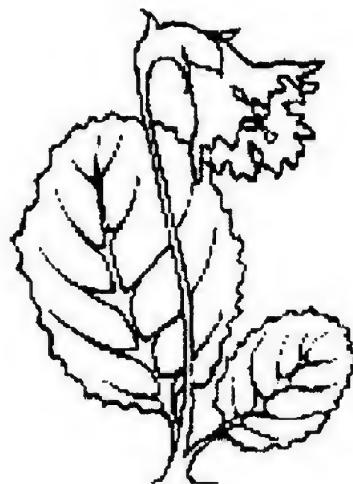
Please send me Botanical Articles or stories or tips on plant identification that you think would be good to include in one of our SHORTIAs. If you see anything that needs correction or if you have additional information about a subject or perhaps a personal experience related to a subject, send that in too, and I can include it in a future SHORTIA. Please try to get this to me by the first week of September to get it into the Fall issue.

SHORTIA

NEWSLETTER OF THE

WESTERN CAROLINA BOTANICAL CLUB

Fall 2018



Shortia galacifolia

Oconee Bells

President	Susan Sunflower	Secretary	Mary Standaert
Vice-President	Gayle Mercurio	Treasurer	Alan Graham
Members at Large	Joe Standaert and John Harrison		

MEMBER NEWS

Field Trip Cancellations: Occasionally, field trips must be cancelled or changed either for weather conditions or other reasons such as road closings. Such changes are sent out by email to all members by 7 AM the day of the field trip. If you do not have email access, please call the leader, co-leader, or recorder (whose phone numbers are listed on the schedule) to be sure that the walk is going to go as planned. Indoor programs are cancelled when Henderson County Schools are closed (see <http://www.hendersoncountypublicschoolsnc.org>) but NOT necessarily cancelled because of delayed opening.

For any change of address, email or telephone number, please inform Alan Graham, 42 Autumn Glen Court, Brevard, N.C., 28712. 828-884-3947 —— adgraham@comporium.net.



PRESIDENT'S MESSAGE

by Susan Sunflower

The big news for WCBC is Lucy Prim is resigning as our editor of SHORTIA. This is her final issue. Lucy has researched, written and illustrated articles with elegant drawings, in addition to editorial tasks, since the 2014 Autumn issue. There has been a surge of other excellent writers, Penny Longhurst, Susan Goldsworthy, Larason Lambert, Ken Borgfeldt, Bonnie Arbuckle, Karen Koelling, Millie Pearson, Francis Jones, Kim Spenser, Aleta Tisdale and others. Quite the impressive line-up! Together they have brought SHORTIA to a professional level, and it is much appreciated by all of us.

So far, we've found no volunteers to take on the job of editing what has been four glorious editions a year. Perhaps this is you? Or two of you?

Over the years (45 of them!) SHORTIA has changed its look and content, from mimeo'd sheets to our emailed editions and now our on-line archives, ranging from notes of trips to first-hand, researched and illustrated articles, in color!

What shall we do now? Is this farewell or is it an opportunity to change directions, format... perhaps one edition each spring, perhaps limiting the number of articles, or changing the format to periodic articles published on-line as members submit them? That is, a complete separation of editor and publisher. Perhaps you have suggestions for SHORTIA's future? or ideas for an article? This requires one or two of us to take on editorial leadership. How about you?

Please contact me with ideas and suggestions with your volunteer smiles! Cheers, big thanks to Lucy and all the writers, Susan Sunflower (772.242.5303)

RSVP ASAP and THANKS!



What does the word “Ternate” Mean?

by Lucy Prim

This summer I found myself going down a rabbit hole, trying to catch hold of the term “ternate.” At this point, after lots research and looking at pictures in a great number of books, I think I have an idea what the term means and how it can be used to describe plants leaves. But a few months ago, when I first started out, this journey wasn’t as straightforward as it usually is when you try to learn a new word. The word “ternate” is succinctly defined in the glossary to Dick Smith’s book, “Wildflowers of the Southern Mountains” by these two little words: “In threes.”

What a deceptively simple definition! I was still confused because when I came upon the word in the text it wasn’t that simple. That is because Dick Smith uses the word again and again in combination with prefixes and suffixes and the words “compound” and “decompound”. Some, but not all, of these expressions were in the glossary. Dick Smith undoubtedly expected us to be nimble minded enough to put two and two together, and understand the meaning of expressions such as “ternately decomound”, but my mind was not proving to be nimble enough.

Wondering whether I was particularly dim when it came to understanding this word, I did a little experiment. I asked a number of Botany Club members what the word meant. Only one person knew. That was Peggy! She right away knew it meant “in threes”. When I asked her how she knew, she laughed and said, “I just knew it!”

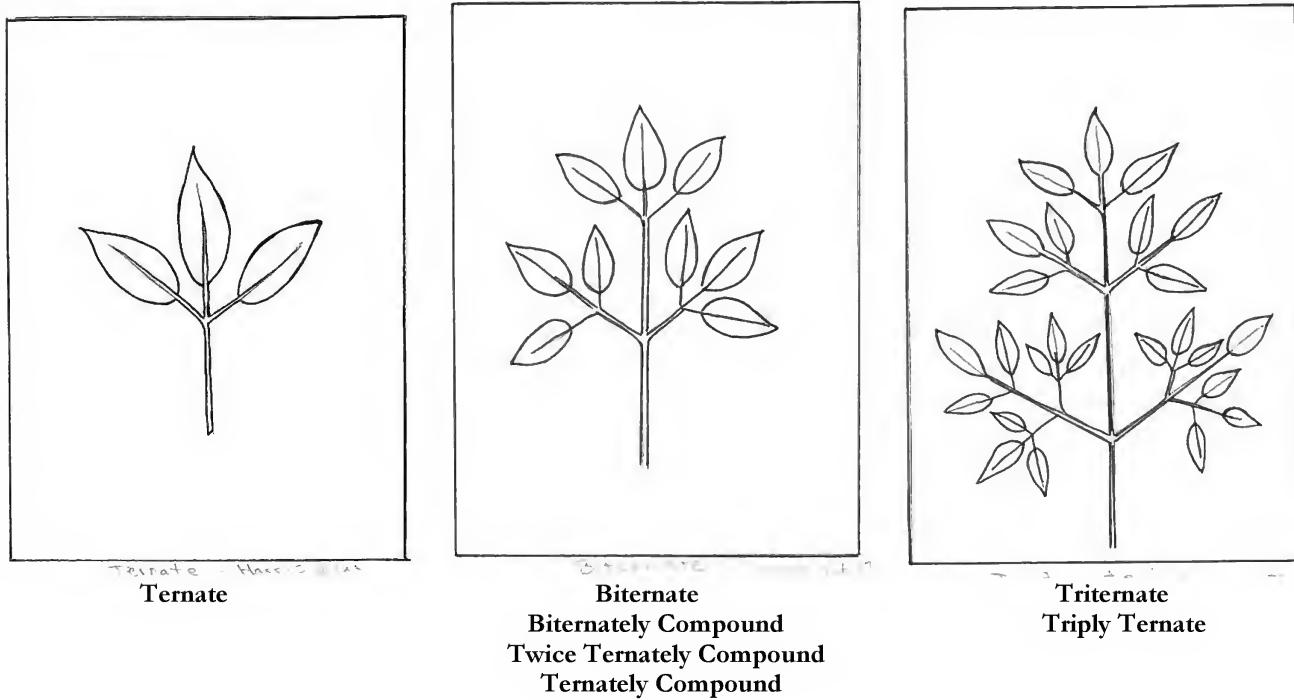
Since nobody else I asked knew this word, I decided to write an article for Shortia, defining the word and giving all the examples of its use I could find by going through Dick Smith’s book. Of all the authors writing flower-identification books in my collection, none uses the word “ternate” as frequently as Dick Smith!

I got so intrigued and confused doing this little project, I almost forgot how it all started. I cast about in my mind, trying to remember. Suddenly it came to me. It all started on our walk to Whiteside Mountain

this past spring. As we walked along the path, I began noticing lots of big green unfamiliar looking leaves (really, they were leaflets) mixed in with all the other more familiar looking green leaves. I bent down to get a closer look, and I noticed something quite distinctive about them. There were three stems that came together at a central spot. There were dozens of them. When Joe was nearby I said, "I wonder what this is, Joe?" Right away Joe said, "Sarsaparilla!"

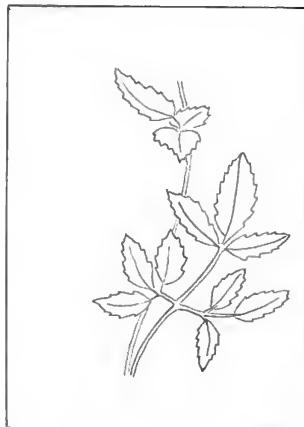
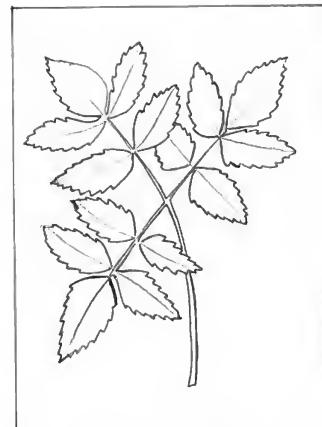
Aha! What a great thing to learn! I wanted to remember these leaves so I took some pictures and then back at home looked up the description in Dick Smith's book. This is what it said: "This smooth plant has a solitary, ternate basal leaf with 5 pinnate segments in each division." I did not know what the word "ternate" meant! I looked it up in the glossary, and that is how it all began.

The general idea of what the word "ternate" means can be found illustrated in this useful book, "Plant Identification Terminology - An Illustrated Glossary" by Harris and Harris.



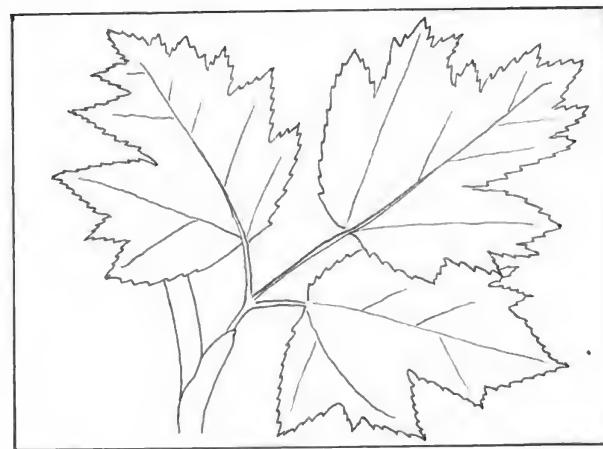
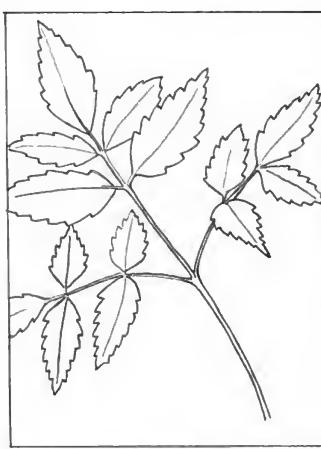
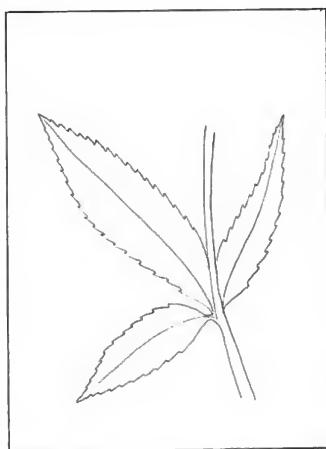
In the following examples, I have quoted the description of various leaves in Dick Smith's book, and then done a little sketch to show how this description pertains to real leaves, many of which we find on our Botany Club walks. It is interesting how the word "ternate" is used in so many slightly different ways! And it is also interesting that most of my other identification books either seldom or never use this term. Maybe it is an old-fashioned expression. Nevertheless, it's quite nice to learn a new word!

Ternate—Sarsaparilla, *Aralia nudicaulis* -- “a solitary, **ternate** basal leaf with 5 pinnate segments in each division.”



Once Ternate: *Zizia aurea* and *Z. trifoliata*: “upper leaves **once-ternate....**”
Zizia aptera: “the cauline leaves **are once- or twice-ternate”**
Thaspium trifoliatum: “the basal leaves may be either simple and ovate with a cordate base or **once ternate.”**

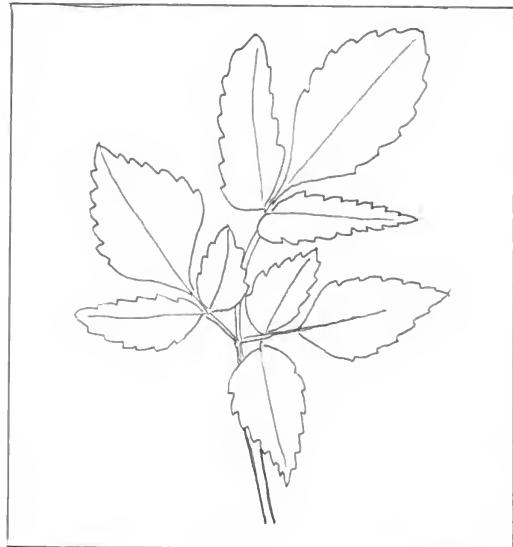
Ternately compound—*Thalictrum*: “All of our plants in this genus have **ternately compound** leaves...”



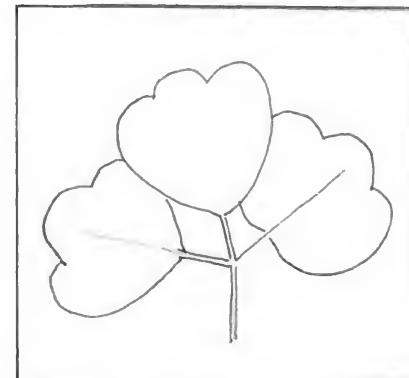
Bowman’s Root, *Gille-
nia trifoliata*: “the prin-
cipal leaves are **ter-
nately compound...**”

Aruncus dioicus: “Its
leaves are **2 or 3 times**
**ternately com-
pound...**”

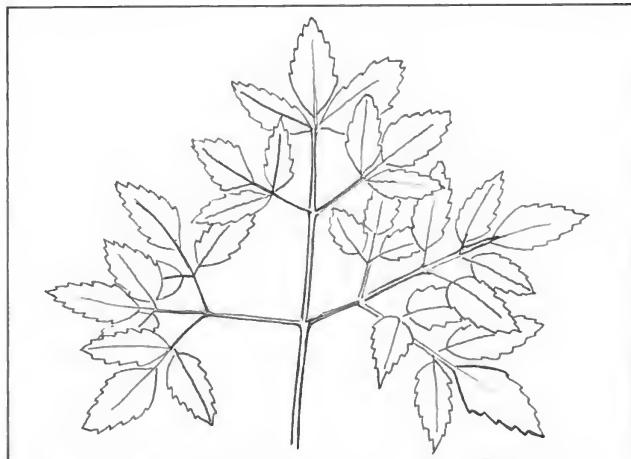
Heracleum maximum: “A tall, coarse plant
sometimes reaching nine feet in height,
hairy below, with **ternately or pinnately**
compound leaves.”



Twice Ternately Compound—Dick Smith uses this expression to describe *Osmorhiza claytonii*, Sweet Cicely: “The leaves of *Osmorhiza claytonii*, Sweet Cicely, are mostly **twice ternately compound**.”

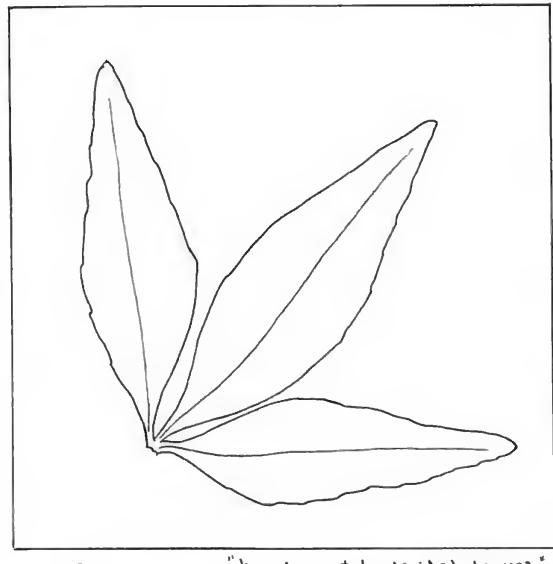


Biernately Compound—Describing *Thalictrum thalictroides*, Dick writes: “The segments of its biernately compound leaves are small....”



Ternately decompound -- “American Lovage, is a tall plant with leaves **ternately or pinnately decompound**.”

Ternately divided -- “*Coreopsis major* has **ternately divided** leaves.”



Below are a few more words from Dick’s glossary that are used in his descriptions using the word “ter-nate”.

Pinnate— “Arranged feather-like on either side of a common axis.”

Compound— “Referring to a leaf, composed of two or more similar parts.”

Decompound— “Referring to a leaf, repeatedly divided into leaflets.”

The prefix “de” in the word “decompound” means there are more and more leaf divisions. My everyday experience with the prefix “de” led me to think the word “decompound” would mean fewer divisions, not more. With words that quickly come to mind, such as “deconstruct”, “denature”, “deforest”, “depopulate”, the “de” refers to undoing something, or making it less of itself. But here, “de” seems to be describing an intensification, more and more divisions, intensifying the quality of being compound. How confusing and surprising!

So, to sum up this article about the word **Ternate**:

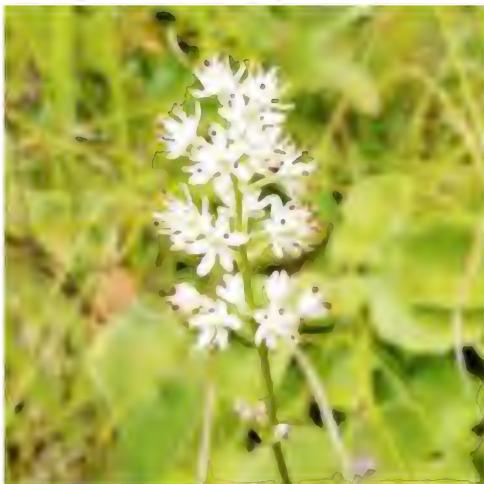
- 1) You can use this word in many ways with various prefixes and suffixes.
- 2) If you want to understand Dick Smith’s descriptions you better know what this word means.
- 3) Lastly, as Peggy succinctly put it, “Ternate means, “**In threes!**”



Goodbye Tofieldia!

by Penny Longhurst

We all have different reasons for liking certain plants. Maybe it's the color, the shape, the scent, and/or the name. Since I first saw it up at Wolf Mountain Overlook I've had a soft spot for Sticky Asphodel. I like the flowers, the seed pods (the first time I saw them I thought they were amazing red flowers!), and both the common and botanical names. *Tofieldia glutinosa*; what an excellent name, such fun to say out loud! Imagine my dismay labelling pictures for the website when I noticed that *Tofieldia glutinosa* is no more. Instead it has been renamed *Triantha glutinosa*.



Thomas Tofield (1730–1779) was a British hydrological engineer and waterways surveyor who worked mainly on land drainage and the diversion of rivers. He was an amateur botanist and collected plants for William Hudson to be included in his *Flora Anglica*, published in 1762. Appropriately, since Tofieldias generally grow in boggy places, the genus was named after Tofield. However, the discovery of our *Tofieldia glutinosa* is attributed to Michaux. Glutinosa means sticky; hence the common name Sticky Asphodel. *Triantha* means three-flowered, indicating that the flowers grow in clusters of three along the stem. That can just be seen in the pictures above.

Tofieldia and *Triantha* are both members of the Tofieldiaceae or False-asphodel family. According to Weakley, there has been controversy for years over the distinction between the genus *Tofieldia* and the genus *Triantha*. The ITIS Report still includes three species in the genus *Tofieldia*, but *T. glutinosa* and *T. racemosa* have been renamed and moved to the genus *Triantha*. Fortunately, *Tofieldia glutinosa* is the only member of the Tofieldiaceae found on our master plant list, so with any luck we may be able to remember *Triantha*. However, it's not nearly as much fun to say as *Tofieldia*!



Phryma leptostachya—Lopseed

by Lucy Prim

Phryma leptostachya, our familiar Lopseed, is a rather special plant. It is in a genus which contains only two species worldwide! Our North American Lopseed is found widespread over much of eastern North America and the Asian species is widespread over much of Asia. Lopseed is an example of the fascinating eastern Asian/ eastern North American disjunction pattern which Jenny Lellinger taught us about years ago in one of our indoor meetings.

Scholars used to think the two species of Lopseed were so morphologically alike, they could be considered the same species. But now, after more work has been done on a molecular level, the new thinking is that they are two separate species, having separated millions of years ago.

The Asian version of this plant has stirred up an amazing amount of interest recently, which can be seen by Googling the term and seeing the great number of articles that pop up, many in Asian languages. Lopseed has been traditionally used as an insecticide, and it is these properties which seem to be the reason for the recent interest. The plant contains chemicals which have an effect on the nervous system of houseflies and three species of mosquitoes!

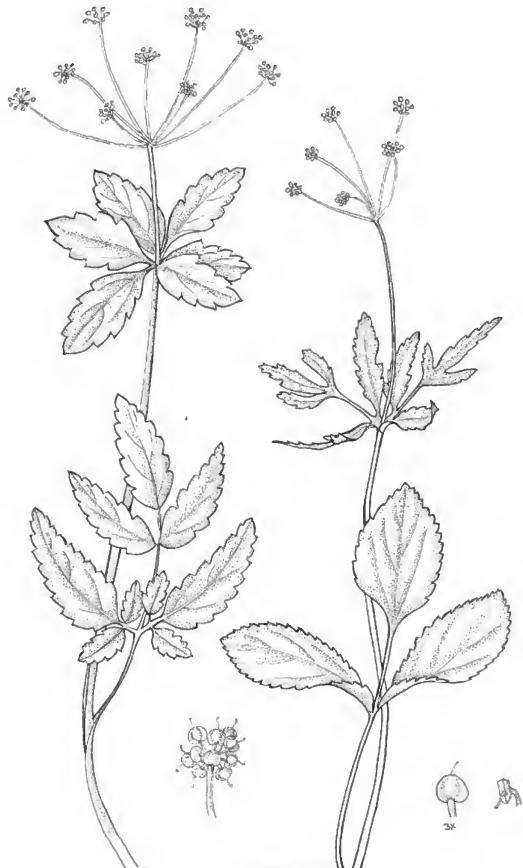
I became interested in this plant because a few years ago it suddenly appeared in my woods! There was only one plant then, and this summer I counted four of them, so it must be happy and spreading around. I am so delighted with it and its curious little seeds that point down so distinctively. Here is one plant, the only one of its type here in North America, which unlike *Thaspium* and *Zizia*, is easy to identify”!



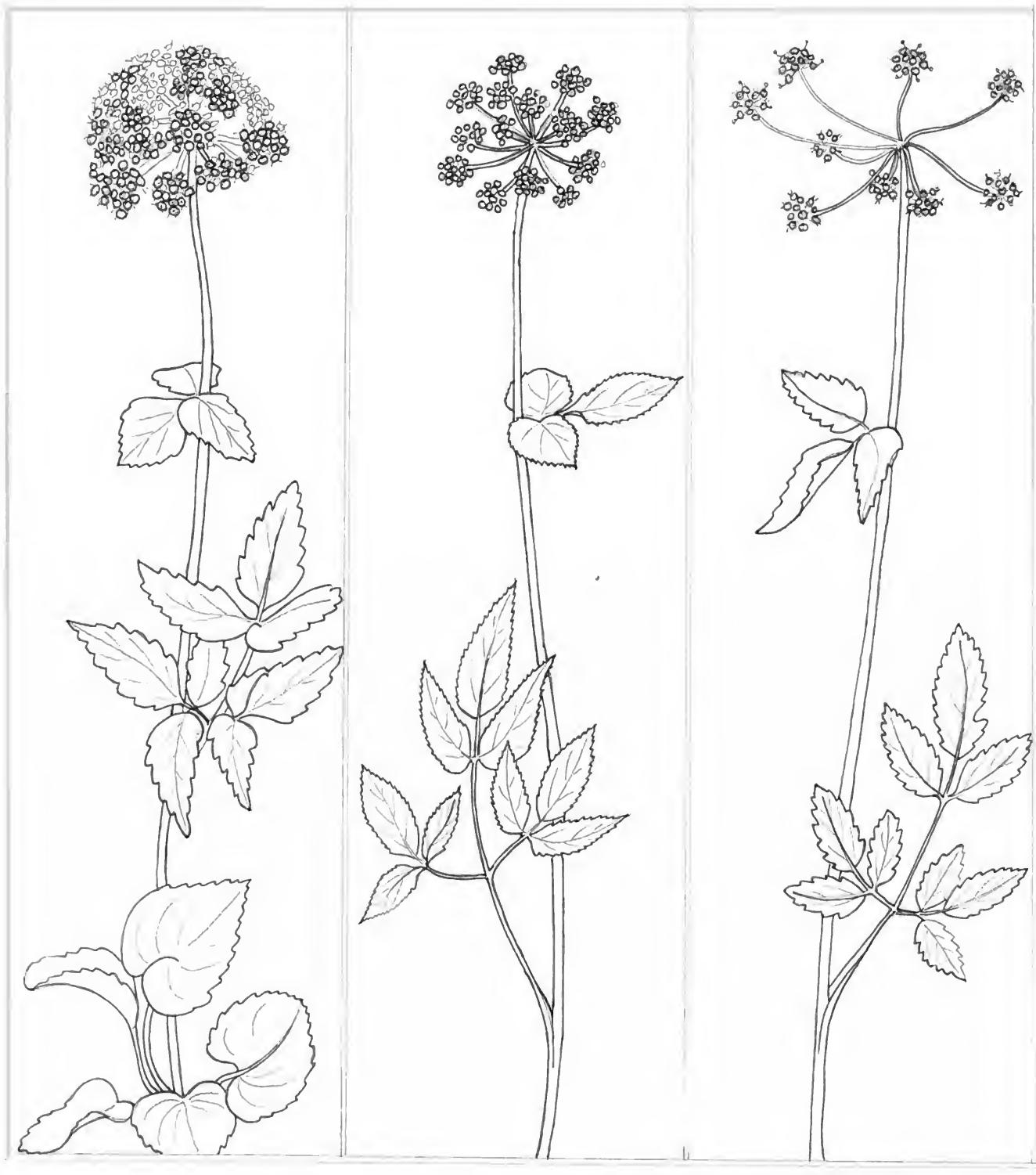
Thaspium and Zizia

by Lucy Prim

Thaspium and *Zizia* are notoriously difficult to tell apart. How amazing it is that they look so similar and are completely different species! I have studied and studied the tiny little yellow flowers of a couple of the species and can see no difference at all, though perhaps with better magnification I could observe some differences. When we come upon one of these on our outings, we get out our magnifying glasses to try to see whether the central flower is stalked or not, and it is usually such a complicated jumble in the center of those little umbellets it's practically impossible to see the central flower, much less whether or not it has a stalk. And as Joe has pointed out, that clue isn't altogether reliable anyway. Because of all this confusion, I thought I'd make one more chart, trying to show our three *Zizias* and three *Thaspiums* in sketches, in hopes that it might make it easier to tell these difficult plants apart. I received a few skeptical looks and comments when I first started mulling over the possibility of doing this project, but I decided to give it a go anyway. I did have fun doing it, and for a short time I felt like I'd learned how to tell one from another, in theory anyway. Will I remember by next spring on one of our walks? Not likely! I will have to bring my chart! One thing to keep in mind is that later in the season, when *Zizia* and *Thaspium* have gone to seed, we have a much easier time telling them apart. *Thaspium* has winged seeds and *Zizia* has wingless seeds.



Here is a picture of two *Zizia trifoliata* plants, one I found growing in my own woods and the other growing in Dupont Forest. See how different the leaves look! But both plants have coarsely toothed leaves and airy, sparse-looking umbels. These are very good clues to help us tell them apart from their look-alike, *Thaspium trifoliatum* with its denser umbel and more finely toothed leaves. I also drew the seeds, which do not have wings, but have gentle ribs like tiny pumpkins.



Zizia aptera Heart Leaf Alexander
Basal leaves are heart shaped

Leaves do NOT have a well-developed callous tip

7-15 umbel rays

Zizia aurea Golden Alexander
Lower leaflets are finely toothed, with
10-25 teeth per inch

10-18 umbel rays

Zizia trifoliata Golden Alexander
Leaflets are coarsely toothed
5-10 teeth per inch

Usually fewer than 10 umbel rays



Thaspium trifoliatum Meadow Parsnip
 Yellow or maroon flowers
 Basal Leaves—Heart shaped or once ternate
 Teeth have a callous tip
 Leaf margins have a thickened translucent border

Thaspium barbinode Hairy Jointed Meadow Parsnip
 Small hairs are in the upper nodes of the leaves
 Leaflets are coarsely toothed as shown
 8-10 umbel rays

Thaspium pinnatifidum A rare endemic
 Very finely dissected leaflets



What's in a Name – Michauxii

by Penny Longhurst

I love the summertime when the lilies are blooming. Although Turk's Cap Lilies (*Lilium superbum*) are guaranteed to bring smiles, the smaller Carolina or Michaux's Lily (*Lilium michauxii*), the official flower of North Carolina, is elusive compared to its more showy cousin. Recently Michaux's Saxifrage (now *Micranthes petiolaris*) was blooming at Wolf Mountain Overlook. So, who was Michaux?



Michaux's Lily (*Lilium michauxii*)



Michaux's Saxifrage (*Micranthes petiolaris*)

Born in 1746, André Michaux grew up on a farm located on the royal estate of Versailles, southwest of Paris, France. From an early age he was interested in agricultural sciences, experimenting with different methods of cultivation. In 1769 he married, but sadly his wife died in 1770 after the birth of their only child, François André. Louis-Guillaume Lemonnier, personal physician to King Louis XV and Professor of Botany at the Jardin du Roi, took an interest in Michaux and persuaded him to study for a career as a naturalist, first at Versailles and then in Paris. As part of his training he travelled to England and the Pyrenees, visiting fellow botanists and gardens, and collecting flora and fauna. Upon his return he requested a commission from Marie Antoinette, wife of King Louis XVI, to travel to the East to collect trees and plants for her gardens. His request was granted and he set off for Persia in February 1782.

Michaux was away for 3 long years. Nothing about his trip was easy. The voyages were hindered by storms and quarantines and their caravans were delayed by heat, cold, and/or rain. The travelers were often attacked by hostile locals and were forced to remain in Aleppo for 6 months while arrangements were made to continue to Baghdad, which they finally reached in December 1782. Despite everything, Michaux collected plants and seeds at every opportunity during his travels and sent them back to his sponsors in France. In March 1783 Michaux finally left Baghdad to journey on to Persia, a trip that would take another 6 months. During this trip his boat was captured by hostile Arabs who stole all his belongings and imprisoned him for 8 days before he was rescued by the British consul. Michaux travelled throughout Persia until August 1784, when he slowly started homeward, returning to Versailles in June 1785.

Having caught the travel bug, Michaux asked to be sent back to Asia. However, the King had other plans. Several years of war had decimated the French forests and he sought opportunities to obtain plants, seeds, and fruits of forest plants and trees from North America to replenish the forests, and also find new forage materials for domestic animals. He chose Michaux to carry out the commission as Royal Botanist.

Michaux arrived in New York in November 1785 after a voyage of 47 days. This time 15-year-old François accompanied his father, as did Pierre Paul Saunier, a gardener who was to establish a nursery and take care of acquired plants. Michaux purchased 29 acres of land in Hudson County, NJ for his nursery (now occupied by the Hoboken Cemetery) and immediately started collecting seeds and plants for shipment back to France, including Red and White Oak acorns, American Chestnuts, Azaleas, Tulip Trees, *Liquidambar*, and *Kalmia*. During the first year alone, he shipped 5,000 trees to France! The logistics of how this was done in small sailing ships is staggering! Thanks to his letters of commission from the King, Michaux was invited to visit and become friends with the American elite throughout the Mid-Atlantic region, including Benjamin Franklin, George Washington and, best of all, William Bartram, who was to become a life-long friend.

In September 1786 André and François Michaux arrived in Charleston, SC to explore the flora and fauna of the southern states. It quickly became clear that they needed to create a nursery here also to keep the collections until they could be shipped to France. Michaux purchased 111 acres of land, built a house, and created planting areas. Part of that property is now on the Charleston Air Force Base.

In early 1787 André and François, accompanied by John Fraser, travelled through the South Carolina lowlands to Savannah and then upriver to Augusta, collecting plants along the way. Interestingly the Michauxs developed a great disliking for Fraser during this trip. They found him botanically ignorant, collecting large quantities of common plants and thus delaying travel, and suspected him of trying to claim their rarer discoveries. Consequently, they took the first opportunity available to part company with him. They would not meet him again until January 1791 when he visited them in Charleston, but apparently, they did not like him any better the second time around, recognizing that his main object was finding plants to sell!

Between 1787 and 1796, Michaux explored from the Atlantic Ocean to the Mississippi River and from Hudson Bay to St. Augustine, the capital of Spanish Florida. Michaux named Bush Clover after Senor Céspedes, the Spanish governor, who had kindly granted him permission to explore the territory. Unfortunately, probably due to a printer's error, the genus name became *Lespedeza*, rather than *Cespedeza*!

His journeys in the Carolinas are well documented in the publications of David Rembert and Margaret Seaborn. Seaborn's essay is fascinating because she provides the English translation of Michaux's journals during 1787 and 1788 when he was travelling in Oconee County SC. Then her commentary describes exactly where he went, including railway tracks and current roads that cross his route, as well as other specific locations. Sadly, many of the places he visited were flooded by the 1955 construction of the Savannah River basin dams in the SC upstate. One of his friends, whom he often stayed with when in the upstate, was General Andrew Pickens after whom the town of Pickens and Pickens County, SC are named.

Michaux made 6 trips into the North Carolina mountains. In June 1787, after evading John Fraser, he and François travelled through Oconee and Pickens Counties, SC and briefly into North Carolina, bushwhacking past Lower and Upper Whitewater Falls and present-day Cashiers into the Little Tennessee River valley, probably near Franklin. They returned in December 1788, exploring the chilly mountains around Lower Whitewater Falls. On both trips they collected *Shortia galacifolia* plants at the "Forks of Kiwi," where the Toxaway and Whitewater Rivers join to form the Keowee (now the Seneca) River, a spot that is now under Lake Jocassee (*Shortia* was not found again until Sargent rediscovered it in this location in 1886). In both June and December 1789 Michaux and François collected in the Blue Ridge Mountains,

ranging from Roan Mountain north to the headwaters of the Toe River. In my previous report on John Fraser (Shortia, Summer 2018), I wrote erroneously that he accompanied the Michauxs to Roan Mountain in the summer of 1789. However, Michaux's journal makes no mention of Fraser being with the group, and as far as I can tell they met only the two times. Michaux was a prodigious collector; on the December trip alone they collected about 2,500 trees, shrubs and plants. Imagine trying to get all those plants down the mountains with packhorses and carts on bridle paths or Indian trails! After a few years of travelling to the far north and west, Michaux returned to the Blue Ridge in the summer of 1794, botanizing between Roan and Grandfather Mountains, and singing the Marseillaise on top of Grandfather Mountain on August 30, 1794! The following year Michaux was back at Mt. Mitchell and Roan Mountain on his way to the Mississippi River, not returning to Charleston until April 1796. This was his last visit to North Carolina. Surprisingly, despite his many visits to the area between the Roan Highlands and Mount Mitchell, Michaux's journals make no mention of seeing Catawba Rhododendron (*Rhododendron catawbiense*), Gray's Lily (*Lilium grayi*), or the Purple Fringed Orchids (*Platanthera* sp.) we now associate with those sites. However, he did note the presence of Sand Myrtle (*Leiophyllum buxifolium*) and Wine-leaved Cinquefoil (*Sibbaldia tridentata*).

François had returned to France in early 1790 to study medicine in Paris, where things were changing for the worse. The French Revolution lasted from 1789 to 1799 and the members of the royal family were guillotined in 1793. Financing Michaux's work in America had always been sporadic and now ground to a halt. In August 1796 the lack of funding forced Michaux to return to France. Sadly, he was shipwrecked off the coast of Holland on October 9, and although he and the other passengers were saved, some of his collections and precious notebooks, including some of his journals, were lost or damaged. Finally, in December 1796 Michaux arrived in Paris and was reunited with François. He was unhappy to discover that as a result of the chaos ensuing during the Revolution many of the plants he had sent from America had not survived, and he set to work to try to repair the damage. He also wrote two books "Histoire des Chênes de l'Amérique" (an illustrated book of North American Oak species) and "Flora Boreali-Americana" (an illustrated guide to the plants he had seen in the Americas).

In October 1800 Michaux was sent by the French government as naturalist on a voyage to explore the coasts of Australia and New Guinea. In March 1801 the ship landed in Mauritius and Michaux, enthralled by the plants on the island, decided to leave the expedition and stay. In June 1802 he sailed to Madagascar to collect plants but died there of malaria in November 1802. François was in America from 1801 to 1803, closing up the nurseries, shipping plants and seeds back to France, and doing a little exploring of his own through the Carolinas, Kentucky, Ohio, and Tennessee. He did not return to France and hear of the death of his father until March 1803. He published an account of his trip under the title "Travels to the West of the Allegheny Mountains".

Twenty-four genera and around 300 plants native to the Carolinas have been credited to André Michaux. Plants we are familiar with include White Clintonia (*Clintonia umbellulata*), Green Adder's-mouth Orchid (*Malaxis unifolia*), Buffalo Nut (*Pyrularia pubera*), Flame Azalea (*Rhododendron calendulaceum*), Catawba Rhododendron (*Rhododendron catawbiense*), Piedmont Rhododendron (*Rhododendron minus*), Sticky Asphodel (*Trientalis glutinosa*), Southern Mountain Cranberry (*Vaccinium erythrocarpum*), and Appalachian Bunchflower (*Veratrum parviflorum*). Clearly, he was exploring in the same places we can now walk so easily. A complete list can be found in the manuscript by Rembert (2004) and on the Michaux.org website. Oh, and by the way,

Michaux's Lily is credited to Jean Louis Marie Poiret, a French botanist who never set foot in the Americas, and Michaux's Saxifrage to Nathaniel Lord Britton, one of the authors of "Illustrated Flora of the Northern United States, Canada, and the British Possessions."

François, who died in 1855, became a distinguished naturalist in his own right, specializing in forestry. After a second visit to North America he published "The North American Sylva; or, A Description of the Forest Trees of the United States, Canada, and Nova Scotia." Michaux State Forest in Pennsylvania is named after him. He donated his father's journals to the American Philosophical Society and left his estate to the APS and the Society of Agriculture and Arts in Boston. The author abbreviation, F.Michx. or Michaux f., designates plants attributed to François, which include Black Sugar Maple (*Acer nigrum*) and Serviceberry (*Amelanchier arborea*).

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This is the last issue of Shortia that I'll be doing, and very likely the last Shortia we will have, unless somebody else decides to give it a go. Over the last four years I have learned so many things—too bad I don't remember them all! It was quite an interesting and absorbing experience in many ways. A big thank you goes to all the people who contributed articles over the years, and a big thank you also to Dave Lellinger who so kindly proofread each issue and made immensely helpful corrections. Penny Longhurst especially was an amazing source of great articles. I want to send a big thank you to everybody else who contributed: Bonnie Arbuckle, Ken Borgfeldt, Susan Goldsworthy, John Harrison, Francis Jones, Karen Koelling, Rosemarie Knoll, Juanita and Larason Lambert, Millie Pearson, Jeanne Smith, Kim Spencer, and Susan Sunflower and Aleta Tisdale! If anybody would like to carry on from here, you can make Shortia as long or as short as you like, and certainly don't need to do the sorts of things I've been doing. Whatever you do would be appreciated. And one thing you will be assured of is a big thank you from me every time you come out with a new issue!

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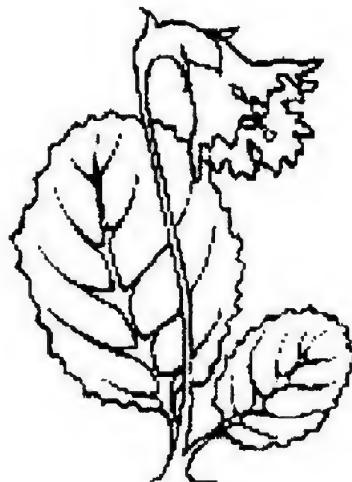
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There was no Winter 2018 Issue of Shortia



Shortia galacifolia

Oconee Bells

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